FIG.1

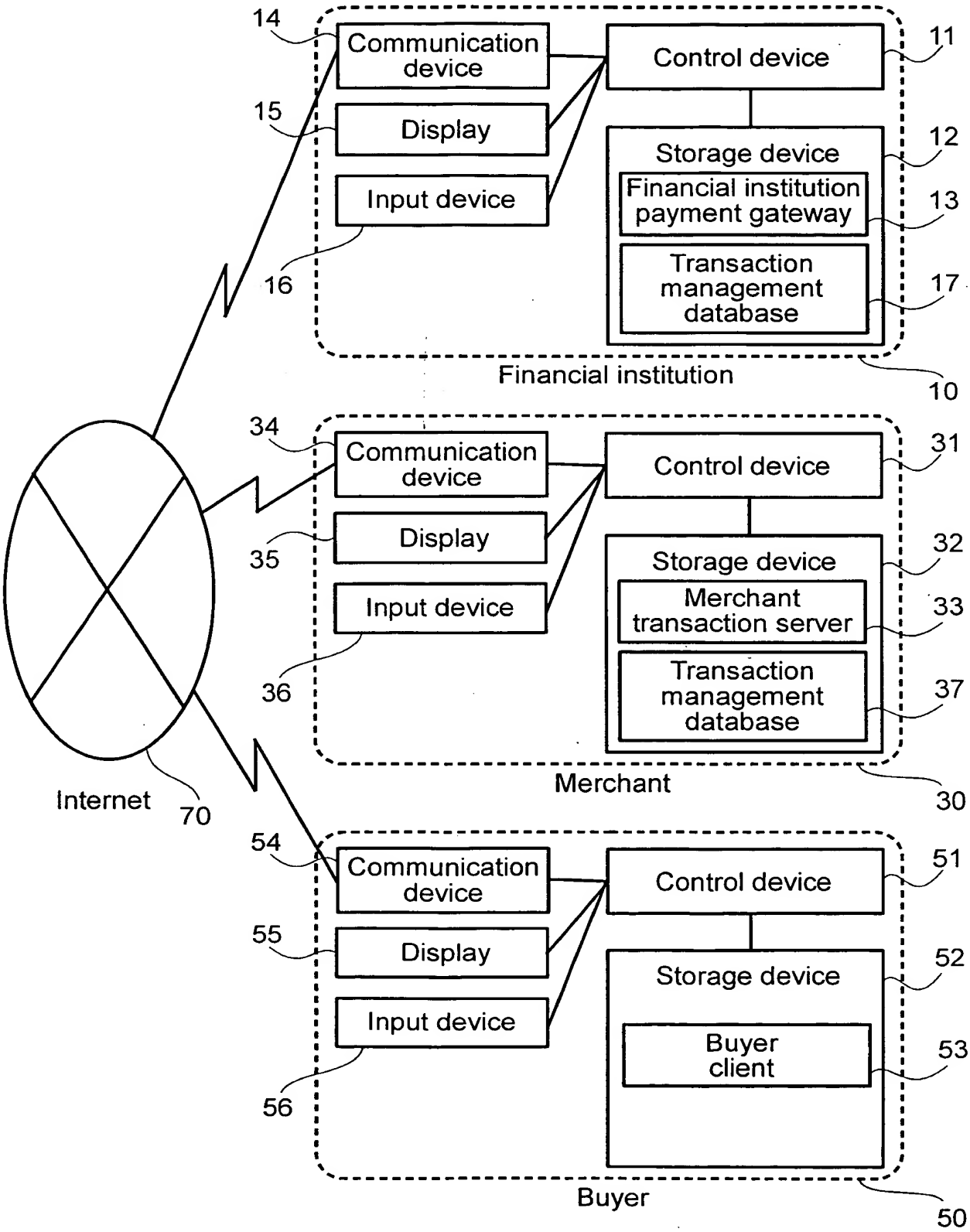

14
Communication device
Control device
11
15
Display
Storage device
12
Input device
Financial institution payment gateway
13
16
Transaction management database
17
Financial institution
10
34
Communication device
Control device
31
Display
35
Storage device
32
Input device
Merchant transaction server
33
36
Transaction management database
37
Merchant
30
Internet
70
54
Communication device
Control device
51
55
Display
Storage device
52
Input device
Buyer client
53
56
Buyer
50

FIG.2

Customer management data 200

201 User identifier	202 Customer account number	203 Passphrase
54321A12345	123-2-1234567	Rt4uH52*Vj

Merchant management data 210

211 Merchant identifier	212 Merchant account number
S234A654	321-1-7654321

Transaction management data 220

221 Transaction identifier	222 User identifier	223 Merchant identifier	224 Payment amount	225 Passphrase processing information
A199907240987 6	54321A12345	S234A654	10,000	4H81bd7g

FIG.3

Billing transaction management data 300

301 Transaction identifier	302 Financial institution	303 User identifier	304 Billing amount	305 Transaction status
M9876543		54321A12345	10,000	Billing request sent

Financial institution data 310

311 Financial institution	312 Network address	313 Merchant identifier
ABC Bank	www.xxx.yyy	S234A654

Merchandise sales transaction management data 320

321 Transaction identifier	322 Product	323 Quantity	324 Shipping address
M9876543	G12B	2	123 Main Street, ...

FIG.4

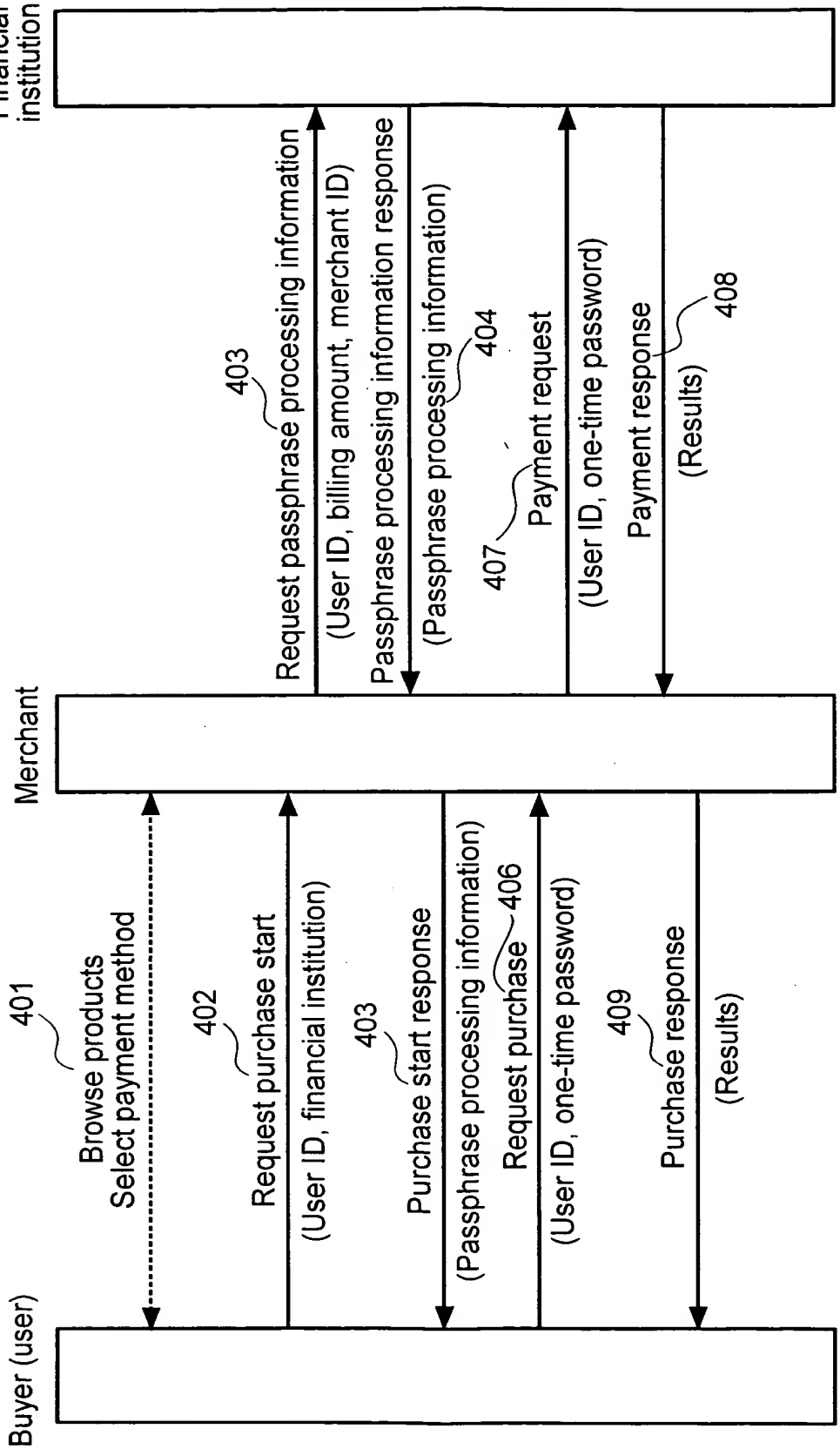

Financial institution
Merchant
Buyer (user)
401
Browse products
Select payment method
402
Request purchase start
(User ID, financial institution)
403
Purchase start response
(Passphrase processing information)
406
Request purchase
(User ID, one-time password)
409
Purchase response
(Results)
403
Request passphrase processing information
(User ID, billing amount, merchant ID)
Passphrase processing information response
(Passphrase processing information)
404
407
Payment request
(User ID, one-time password)
Payment response
(Results)
408

FIG.5

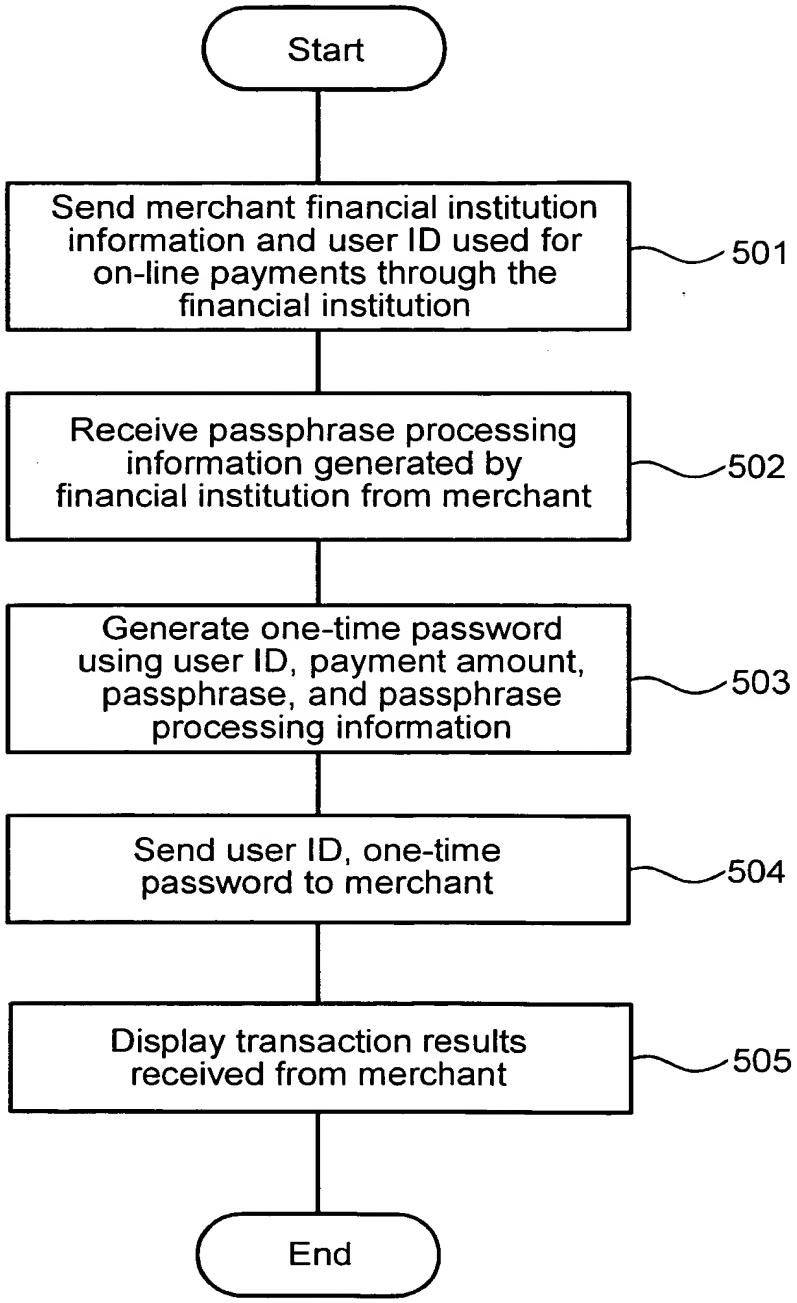

Start
Send merchant financial institution information and user ID used for on-line payments through the financial institution
501
Receive passphrase processing information generated by financial institution from merchant
502
Generate one-time password using user ID, payment amount, passphrase, and passphrase processing information
503
Send user ID, one-time password to merchant
504
Display transaction results received from merchant
505
End

FIG.6

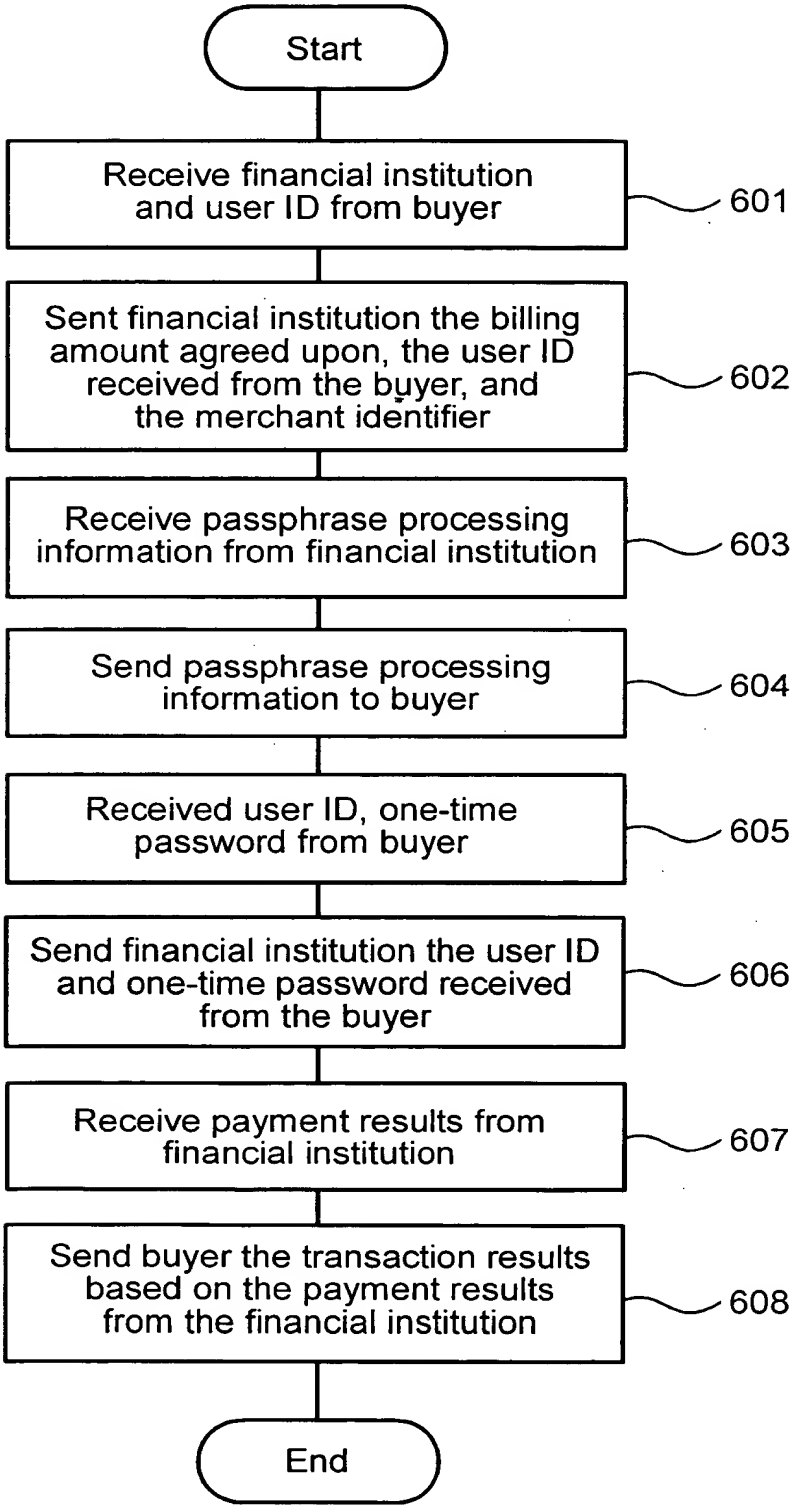

Start
Receive financial institution and user ID from buyer
601
Sent financial institution the billing amount agreed upon, the user ID received from the buyer, and the merchant identifier
602
Receive passphrase processing information from financial institution
603
Send passphrase processing information to buyer
604
Received user ID, one-time password from buyer
605
Send financial institution the user ID and one-time password received from the buyer
606
Receive payment results from financial institution
607
Send buyer the transaction results based on the payment results from the financial institution
608
End

FIG.7

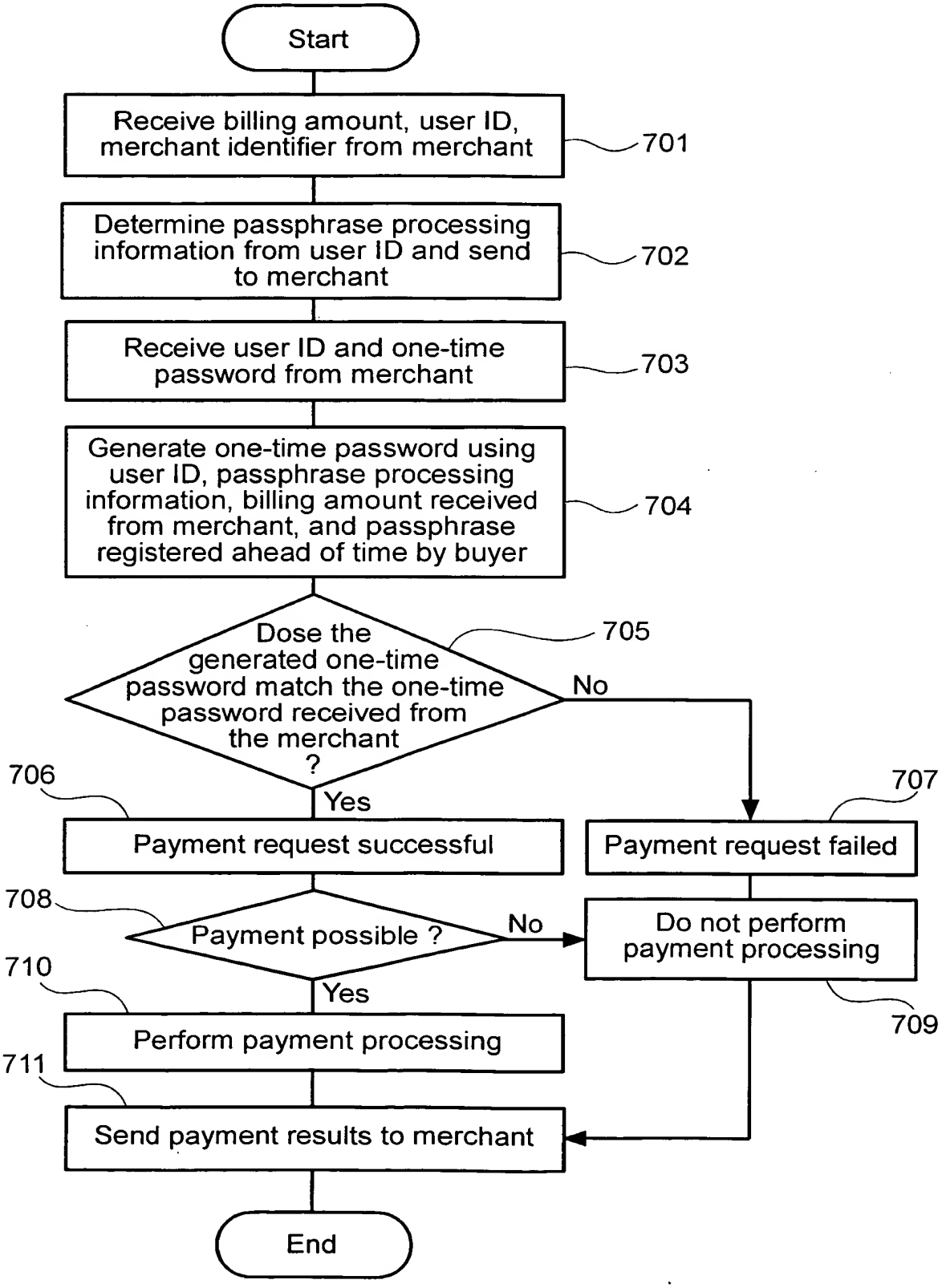

Start
Receive billing amount, user ID, merchant identifier from merchant
701
Determine passphrase processing information from user ID and send to merchant
702
Receive user ID and one-time password from merchant
703
Generate one-time password using user ID, passphrase processing information, billing amount received from merchant, and passphrase registered ahead of time by buyer
704
Dose the generated one-time password match the one-time password received from the merchant ?
705
No
Yes
706
Payment request successful
707
Payment request failed
708
Payment possible ?
No
Do not perform payment processing
709
710
Yes
Perform payment processing
711
Send payment results to merchant
End

FIG.8

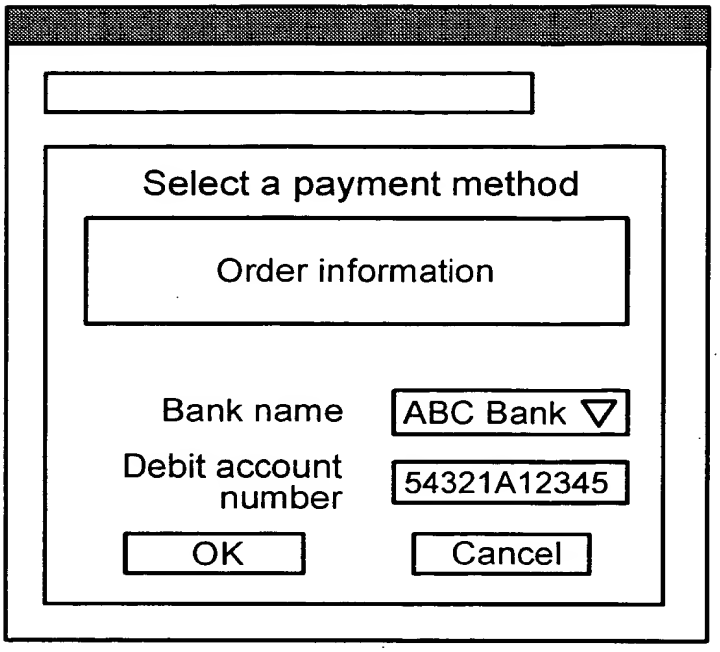

Select a payment method
Order information
Bank name
ABC Bank
Debit account number
54321A12345
OK
Cancel

FIG.9

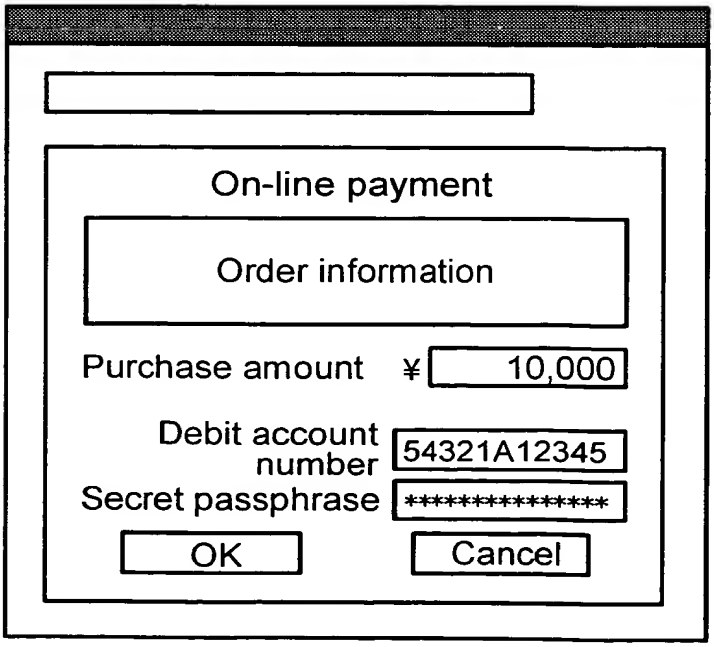

On-line payment
Order information
Purchase amount
¥
10,000
Debit account number
54321A12345
Secret passphrase
****
OK
Cancel

FIG.10

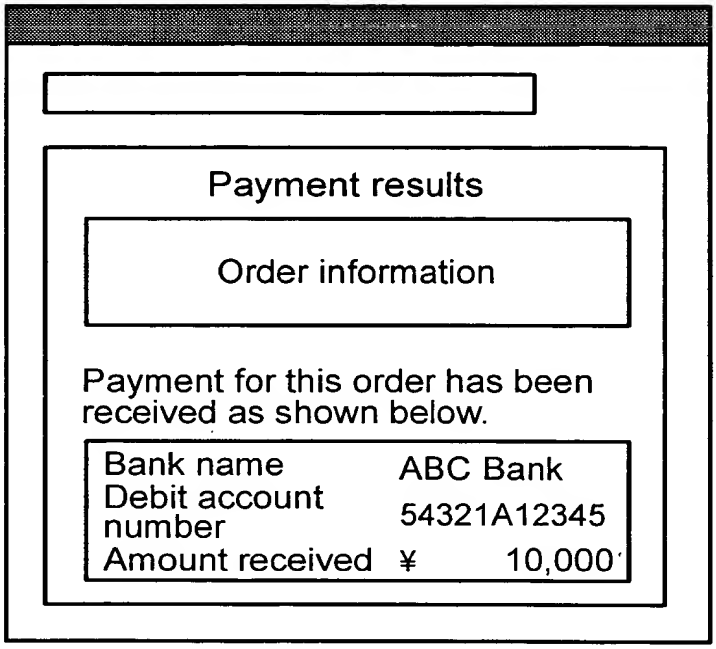

Payment results
Order information
Payment for this order has been received as shown below.
Bank name ABC Bank
Debit account number 54321A12345
Amount received ¥ 10,000

FIG.11

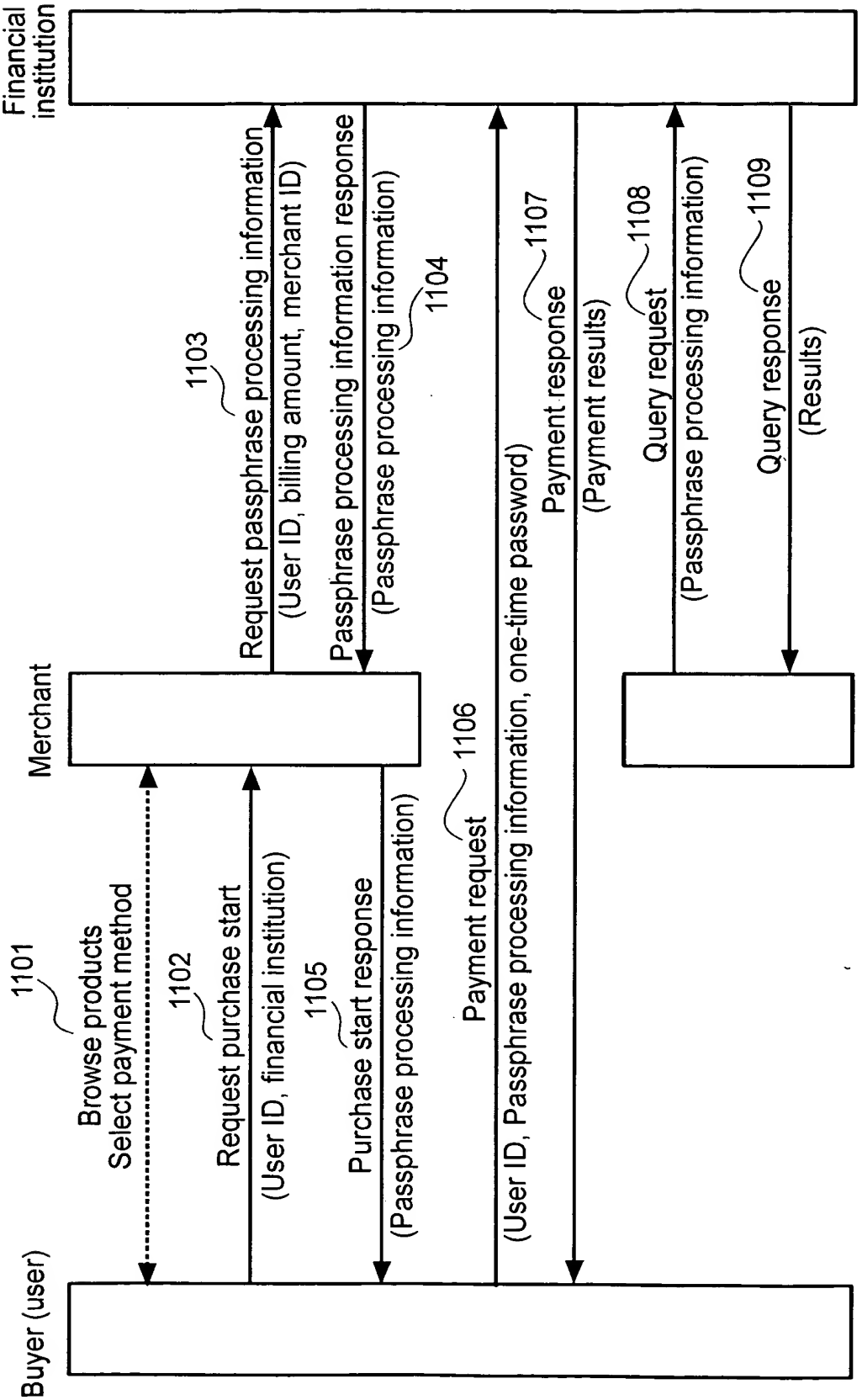
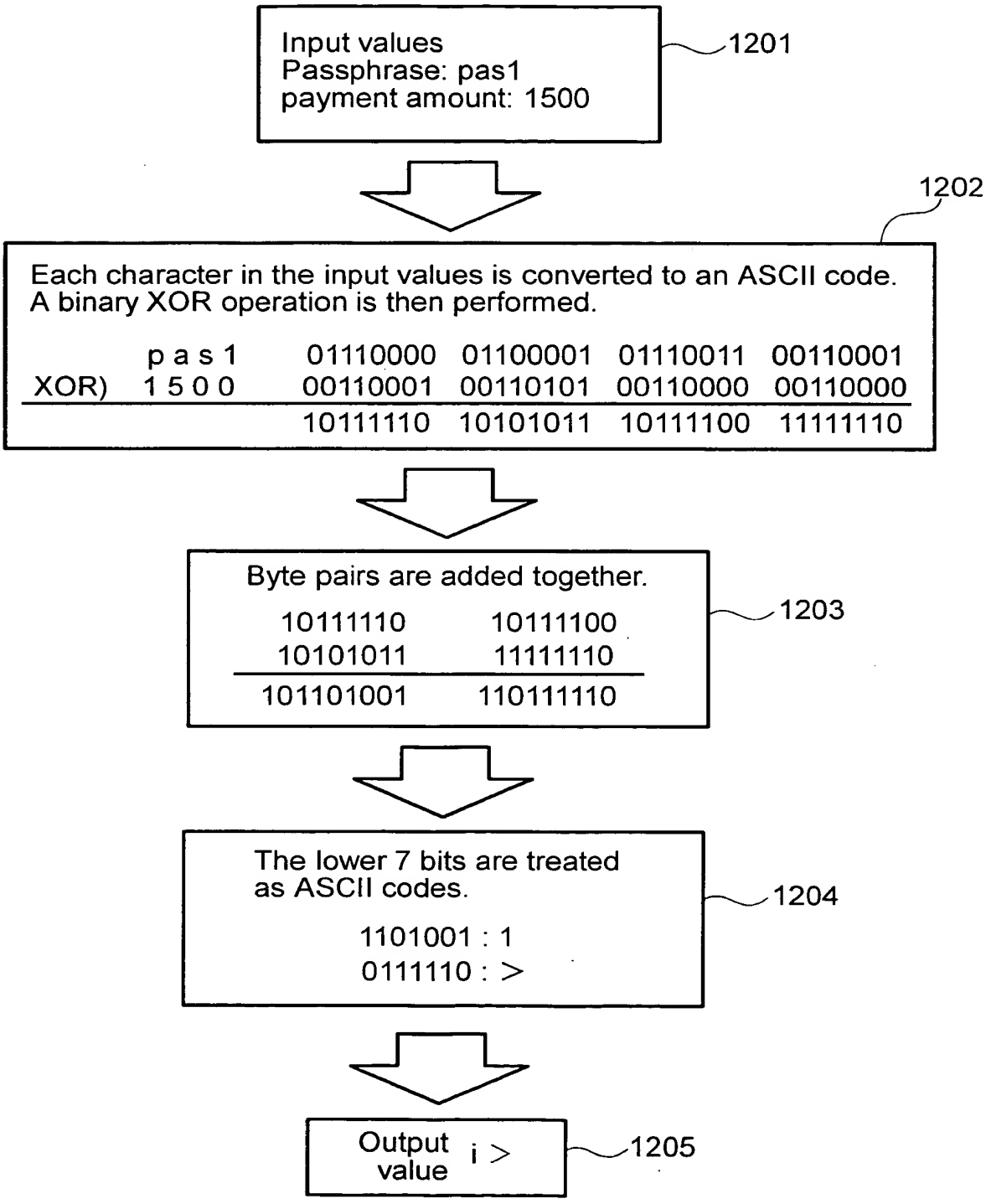

Financial institution
Merchant
Buyer (user)
1101
Browse products
Select payment method
1102
Request purchase start
(User ID, financial institution)
1103
Request passphrase processing information
(User ID, billing amount, merchant ID)
1104
Passphrase processing information response
(Passphrase processing information)
1105
Purchase start response
(Passphrase processing information)
1106
Payment request
(User ID, Passphrase processing information, one-time password)
1107
Payment response
(Payment results)
1108
Query request
(Passphrase processing information)
1109
Query response
(Results)

FIG.12


Input values
Passphrase: pas1
payment amount: 1500
1201
1202
Each character in the input values is converted to an ASCII code.
A binary XOR operation is then performed.
p a s 1 01110000 01100001 01110011 00110001
XOR) 1 5 0 0 00110001 00110101 00110000 00110000
10111110 10101011 10111100 11111110
Byte pairs are added together.
10111110 10111100
10101011 11111110
101101001 110111110
1203
The lower 7 bits are treated as ASCII codes.
1101001 : 1
0111110 : >
1204
Output value i >
1205